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Family Conditions and Practices Related to Waste Paper Output

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FAMILY CONDITIONS AND PRACTICES RELATED TO WASTE PAPER OUTPUT

by

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Family Conditions and Practices

Related to Waste Paper Output

by

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Paper waste discarded by families of five persons in Logan City was studied for two seven-day periods. The sample consisted of 42 families comprised of a father who was employed full-time, a mother, and three children living at home. A questionnaire was administered to each family for the purpose of describing the sample, and to determine some of their family conditions and practices.

Sample families were given plastic bags for storing of waste paper, which was collected at the end of each seven-day period. The weight of all paper discards was tabulated for each family. Seven of these families were put in a category of high paper output and seven families were put in a category of low paper output. Averages were tabulated for the total sample, high paper output category, and low paper output category.

The highest and lowest total paper weights recorded for the 14 days were 62 pounds 5 ounces and 7 pounds 15 ounces respectively.

The average weight for all families was 18 pounds 12 ounces. The average high paper output category was 37 pounds 11 ounces. The average low paper output category was 9 pounds 3 ounces. Through comparing these weights with information found on the questionnaires, the following may be said to have an effect on the amount of paper families discard: method of disposing of newspapers, income, and perhaps occupation of the father.

(79 pages)

INTRODUCTION

The United States is becoming buried in a mass of solid waste. "Today, the environment is being polluted, as never before, by the accumulation of solid wastes--a staggering burden born of affluence, nurtured by rising populations, fostered by technology, and all but neglected by society." (Ellis, et al., 1969, p. 9) As goods in our society have become more abundant and as people have become more prosperous, our waste products, too, have increased. An average of 2.75 pounds of solid waste per day was produced by each individual in the United States in 1920. Today the average is 5.3 pounds per person. "The volume of solid wastes we pile up every year is stupendous--80 billion cans, 38 billion bottles, 40 million tons of paper and cartons, 180 million old tires, 21 million major household appliances, seven million junked automobiles." (Schiller, 1972, p. 172)

Golueke and McGauhey have estimated that approximately 42 to 57 percent of the total solid waste output consists of paper. If each individual produces 5.3 pounds of solid waste per day, between 2.2 and 3.0 pounds of it will be paper. Waste paper in homes can come from a variety of sources including newspapers, magazines, disposable household products, and packaging. When accumulated and measured, the amount produced by a household is quite impressive. A group of five Michigan State University students brought into their home 142 bags of groceries and from these same groceries car-

ried out 72 bags of garbage. (Paolucci, 1971)

In the family setting, each person has great potential for limiting his own solid waste. As such a large percentage of solid waste is paper, perhaps the family would be an excellent place to start reducing paper waste by changing consumption habits.

> Leadership and action at the national level are important. But our country is so vast and varied that simple, blanket solutions to its problems by the federal government are seldom effective. Environment conditions have to be faced where people live. (Harrington et al., 1971, p. 8)

In past research Golueke and McGauhey assumed that as income increased in the individual home, so too, would solid waste. Carroll Latham's study found this to be true regarding waste paper output, but the difference was not as great as expected. The four families whose incomes were less than $8,000 discarded an average of 23 pounds 11 ounces for two seven-day periods, while the three families whose incomes were greater than $12,000 discarded an average of 28 pounds 8 ounces. (p. 38) Thus the difference was only 4 pounds 13 ounces for two seven-day periods. Latham's study suggests possible relationships between some other family conditions and practices and the amount of waste paper output. Those which she points to as possibly affecting waste paper output are home gardening, home canning and preservation, stage of family life cycle, occupation of the father, whether or not the mother works, and method of disposing of newspapers and magazines. Further study of the effects of these conditions and practices on the amount of paper output in homes might lead to better understanding of and perhaps some solutions to

the problem of increasing solid waste.

Problem

The environmental crises of today are making some Americans acutely aware of the problems which face us. A major part of the total environmental problem is paper pollution. The individual discards approximately 2.2 to 3.0 pounds of paper per day. This means that an average family of five would discard between 11 and 15 pounds of paper per day, between 77 and 105 pounds per week, or between 4,005 and 5,460 pounds of paper per year. There is not enough information now known about causal relationships between family conditions and practices and waste paper output to enable educators to make suggestions to aid individual families in lowering their paper output. By looking at some of the conditions and practices within families and by seeking cause-effect relationships between them and waste paper output, it may be possible to propose ways which individual families desiring to reduce their output can follow.

The purpose of this study is to compare selected conditions and practices of families with high waste paper output and those with low waste paper output. By doing so, it is hoped that cause-effect relationships can be found, and the knowledge can be used in educating individual families to become aware of conditions and practices which affect their total waste paper output.

Definition of Terms

1. Family Conditions and Practices: home gardening, home canning and preservation, stage of the family life cycle, occupation of father, employment of mother, and method of disposing of newspapers and magazines.

2. Solid Wastes: Solid materials which come from animal or human life and activities and which are discarded as useless or unwanted.

3. Solid Waste Output: The total of all solid waste products discarded by an individual or family.

4. Waste Paper Output: In this research waste paper is paper discarded by families.

5. Low Paper Output: 10 pounds 5 ounces or less for 14 days. This is the amount discarded by seven families or 16.6 percent of the total sample.

6. High Paper Output: 31 pounds 13 ounces or more for 14 days. This is the amount discarded by seven families or 16.6 percent of the total sample.

7. Sanitary Land-fill: A solid waste disposal method where wastes are deposited in an excavated area, compacted and covered daily with a layer of soil.

8. Incineration: A waste reduction method accomplished by burning at high temperatures to reduce burnable waste to ashes.

9. Composting: A method of recycling organic wastes, the results of which are used to fertilize and condition soil.

10. Environment: Those surroundings which sustain the life of an individual - may be physical (geographical location) or social (family, etc.)

11. Ecology: A term derived from the Greek word "oikos" meaning home or habitat and which refers to the relationship between a living organism and its environment.

12. Pollution: The presence of unclean, unwanted and/or harmful substances in an environment.

Objectives

1. To determine whether family life conditions and practices such as home gardening, home canning and preservation, stage of the family life cycle, occupation of father, whether or not mother works, method of disposing of newspapers and magazines, affect the amount of waste paper output in households.

2. To determine the effect of income on waste paper output.

REVIEW OF LITERATURE

Solid Waste - A Problem

There is, world wide, an increasing awareness of the problems which are inevitable for both developing, and highly industrialized countries in the area of solid waste management. Because of rapid growth in population, in addition to industrial and technological growth, the satisfactory management of both solid and liquid wastes is becoming a very complicated problem. (Ellis et al., 1969, p. 7)

In each additional year of history, the world population is producing more, consuming more, and throwing away more. "Multiple packaging, built-in obsolescence, and the convenience items of a 'use-it-once, throw-it-away' society...." are all contributing to our enormous amounts of waste. (A Citizens' Solid Waste Management Project: Mission 5000, Environmental Protection Agency, 1972 p. 4)

Perhaps Americans are the very worst offenders.

> Today, Americans, with only 7 percent of the world's population, consume nearly half the earth's industrial raw materials. And most of these, in the form of out-worn equipment, discarded bottles, cans, packaging, and yesterday's newspaper, end up sooner or later on the Nation's trash heaps. (A Citizens' Solid Waste Management Project: Mission 5000, 1972, p. 4)

In times past, when materials were scarce and expensive, such things as string and rags were saved, bent nails were hammered straight; waste not was more of a law than an economic way of life. (Current Focus, League of Women Voters Education Fund, 1971, p. 1) Even when times became better, a small population and an abundance

of natural resources allowed the people of the United States to ignore solid waste. (A Citizens' Solid Waste Management Project, 1972, p. 4) Today, however, the problem is a serious one, and growing rapidly worse. Altogether Americans discard 360 tons of solid wastes each year. Included in this would be "80 billion cans, 38 billion bottles, 40 million tons of paper and cartons, 180 million old tires, 21 million major household appliances, and seven million junked automobiles." (Schiller, 1972, p. 172)

The loss of natural resources and the cost of disposing of solid wastes is staggering. The United States spends more than $4.5 billion each year on collecting, transporting, processing, and disposing of solid wastes. This cost is exceeded only by those of education and of highway construction. (Current Focus, League of Women Voters Education Fund, 1971, p. 4)

Paper - A Large Part of the Problem

During the last ten years, there has been a decrease in the amounts of some types of garbage, and an increase in other types. (Current Focus, League of Women Voters Education Fund, 1971, p. 3) Two-thirds of the solid waste discarded today is likely to be paper, metal, glass, and plastic. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 10) Golueke and McGauhey (1970) have estimated that approximately 42 to 57 percent of the total solid waste output consists of paper. From throwaway gum wrappers and paper plates, the disposable industry has expanded into paper ties, dresses, bedsheets, and jewelry. "Marx, 1971, p. 10) Paper is be-

ing used more and more for new and different things.

Waste paper is generated from three main sources: (1) households; (2) retail and industrial establishments; and (3) convertors and manufacturers of paper products. Paper products such as newspapers, magazines, cardboard cartons and boxes, brown paper bags, junk mail and books are sources of waste paper from households. Retail and industrial establishments contributed paper from cardboard cartons, packing, wrapping papers, office waste, computer paper and punch cards. Convertors and manufacturers of paper and paper products have waste from cuttings, printer's waste, reject sheets, boxes, etc. (Kirov, 1972, p. 175)

The different types of paper which are discarded, can be classified into two categories. The first category is packaging, and the second is non-packaging.

Packaging

The materials that Americans use and discard have changed in recent years. "The trend to multiple packaging and to planned obsolescence, ..." have added greatly to the type and amount of solid wastes. (Current Focus, League of Women Voters Education Fund, 1971, p. 1) Mass distribution of goods in the United States has caused packaging to become more popular. With few exceptions, almost everything is packaged in some form or other before it reaches its destination. "In 1966, United States consumers, businesses, and industries spent more than $25 billion on packaging in all its aspects--about 3.4 percent of the Gross National Product." Kiefer states that

consumers spend 75 cents of every dollar on packaging. Consumers want packaging which won't "burn, break, crush, degrade, or dissolve" yet when it comes to discarding the same packages after using them, they want them to burn easily, break, crush, and degrade or dissolve. Kiefer feels that this paradox may be at the "core of the disposal problems posed by packaging materials... ." (Kiefer, 1971, p. 1)

When considering different types of packaging, we find that paper and paperboard dominate the field. In 1966 they represented over half of the total weight of packaging materials, and are predicted to do the same in 1976. About half of all paper and paperboard is devoted to packaging because "... paper can package almost any item that does not need the exceptional protective characteristics of metal, glass, or plastic containers. (Kiefer, 1971, p. 9) Paper is a logical material for packaging since it is relatively inexpensive, highly machinable, strong, and printable. Paper can be combined easily with other materials to improve its performance characteristics. Often when paper is not used as the primary packaging material, it is used for secondary packaging. (Kiefer, 1971, p. 10)

The amount of packaging materials used per year per person in the United States has increased from 405 pounds in 1958 to 525 pounds in 1966, and is expected to rise to 661 pounds by 1976. (Kiefer, 1966, p. 5) In 1966, Americans used 103 billion pounds of packaging materials and by 1976 this number is expected to reach a staggering 147 billion pounds. A part of this increase will be due to in-

creasing population, but about two-thirds will come from increased use of packaging materials. (Kiefer, 1971, p. 11)

Packaging has added convenience for consumers in several ways. Consumers no longer need to wait in line to be given certain items, as they are individually packaged. Time has been eliminated as waiting, counting, and weighing are no longer necessary. (The Packaging Industry and Government, 1971, p. 1)

The food industry is the largest user of consumer packages, using 43 percent of the total amount each year. (Table 1)

Table 1. Comparison of different industries' use of packaging

Food	43.7%
Miscellaneous	21.1%
Beverages	12.6%
Chemicals and Allied Products	11.7%
Paper, Printed and Allied Products	3.9%
Textile and Apparel	2.7%
Hardware	2.4%
Petroleum Products	1.9%

Source: The Role of Packaging in Solid Waste Management 1966 to 1976, Condensation, p. 7, 1971.

Packaging wastes are a "...heterogenous mixture of paper, metal, glass, plastic, wood, and textile packages in thousands of configurations." (Kiefer, 1971, p. 18) As concern with consumerism and ecology grows, the packaging waste will become more aggravating. (Journal of Harvard Business Review, July, 1972, p. 103) This is an area where consumers need to express concern.

Non-packaging

In 1966 a total of 52.4 million tons or 27.3 percent of all consumer paper was used in nonpackaging circumstances. This amounts

to about 277 pounds per person for one year. It is important to distinguish between nine major types or grades of nonpackaging paper. There are five types of paper, and four types of paperboard.

The five types of paper are newsprint, printing paper, fine paper, special industrial paper, and sanitary tissue. Newsprint is a low-quality paper and is used primarily for newspapers. Fine paper is of a higher quality, and is used for businesses forms and stationery, reports, records, etc. Special industrial paper is a coarse paper and is used for such things as tabulating cards, filters, and absorbent papers. Sanitary tissue is a thin and soft paper used for personal products like napkins, toilet paper, and facial tissue. (The Role of Nonpackaging Paper in Solid Waste Management 1966 to 1976, 1971, p. 8)

The four grades of paperboard are special paperboard, which is used for construction papers, book matches, book bindings, etc.; wet machine board is used for products such as shoes and gaskets; construction paper consists of heavy papers used for posters and roofing felts; and construction board, which is used for wall board, tile, and insulation board. Construction board can also be used for paneling and furniture. (The Role of Nonpackaging Paper in Solid Wastes Management 1966 to 1976, 1971, p. 9)

Methods For Disposing of Solid Wastes

The need for concern about disposal of solid waste is evident from the increasing amounts produced each year. R. J. Hughes,

President of Union Carbide Plastic Products Division recently commented on the disposal of solid waste, stating "... solid waste is either used as compost, buried as landfill, burned, or thrown about the landscape." He further added that composting is only practical in rural areas, and that about 85% of all solid waste is either buried in a sanitary land-fill or dumped. (1971, p. 1)

Open Dumps

An open dump is a widely used method for disposal of solid wastes. An open dump is an area of land where solid wastes are left uncovered. Wastes are dumped or disposed of with little or no regard to pollution controls or aesthetic consideration. Open dumps disfigure the landscape, provide health and fire hazards, have adverse effects on land surrounding them, create public nuisances, and interfere with community life and development. (Closing Open Dumps, 1971, p. 4) The Environmental Protection Agency states that:

> Eliminating open dumps will make your community, and America, a better place in which to live. It is a first, essential step toward full application of new, environmentally sound principles in solid waste management. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 3)

There are many disadvantages to an open dump as a method of solid waste disposal. Health hazards are brought about through the presence of biological and chemical contaminants carried by air, water, birds, insects and rodents to man and his domestic animals. (Closing Open Dumps, 1971, p. 1)

Another disadvantage of open dumps is the shelter provided rodents. Burning is often used to discourage this from happening,

however, as not everything in a dump is burnable there are always places for rodents to seek protection. Scavengering is also a dangerous and inevitable occurrence which comes with open dumps. Sharp glass, metals, "... pathogenic organisms, toxic chemicals, and open fires present a real danger to those roaming the dumps." (Closing Open Dumps, 1971, p. 2)

A burning dump, besides polluting the land, adds pollution to the air from the incompletely burned particles and gases in addition to the nauseating stench of smoldering garbage. (Closing Open Dumps, 1971, p. 2) Air pollution is a source of human respiratory disease; and soils buildings, clothing, and furnishings. Open burning presents a fire hazard to surrounding areas.

Composting

Composting is microbial degradation of solid organic materials such as manures, leaves, or municipal refuse, particularly when some use for the end product is intended. (Open Dump Closing... Sanitary Landfill Operation, 1970, p. 1) This is an alternative method for disposing of some solid wastes, however, composting is only practical in rural areas. It can be used temporarily in surburban areas, but is not recommended as a replacement for waste collection and disposal.

Incineration

Incineration, if done correctly, is an expensive method of solid waste disposal. This process should only be used if strict air quality standards are met. Most incinerators currently in use

in the United States are obsolete and do not meet the standards. Many incineration systems have been closed because of their inadequacies, and it is expected that several others will close in the near future because of the prohibitive cost involved in complying with air quality standards. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 9)

Incineration is an excellent method of solid waste disposal when used in connection with a sanitary landfill. Incineration reduces the volume of solid waste as much as 70 to 80 percent. When land is scarce, this may be an important consideration. (The Role of Packaging Solid Waste Management 1966 to 1976, 1971, p. 22)

In Europe, many communities use the incineration process to produce steam for heating, and to produce power for generating electricity. Combining the incineration process and production of power provides an efficient system and aids in cutting costs. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 9)

Sanitary Landfill

Sanitary landfills are growing in popularity as a method of solid waste disposal. The American Society of Civil Engineers defines a sanitary landfill as a "... method of disposing of refuse on land without creating nuisances or hazards to public health or safety, by utilizing the principles of engineering to confine the refuse to the smallest practical volume and to cover it with a layer of earth at the conclusion of each day's operation or at such more intervals as may be necessary." (Current Focus, 1971, p. 6)

From the definition we can identify four basic operations: (1) solid wastes are deposited in a prepared area of the landfill site; (2) solid wastes are spread and then compacted into thin layers; (3) solid wastes are covered daily or as often as needed with a layer of earth; (4) the cover material is compacted daily. (Sanitary Landfill Facts, 1970, p. 1)

"By 1976, 13 percent of the United States municipal wastes will be disposed of by this process, up from 5 percent in 1966." (The Role of Packaging in Solid Waste Management 1966 to 1976, 1971, p. 21) Officials would like to see the sanitary landfill completely replace the dump, as there are many advantages to this method. Some of the advantages are a clean, attractive site for refuse disposal and no objectionable odors or insects. A landfill can be used for most kinds of waste, and can be put into use in a relatively short period of time. Where land is available, the initial cost of a landfill is far less than that of an incinerator. It is the most economical adequate solid waste disposal method. (Current Focus, 1971, p. 6)

Though there are advantages to the sanitary landfill, there are also disadvantages. Degradability is an important factor to consider. Since landfills are used for recreational and other types of activities, it is important that the soil retain few tell-tale traces of its landfill days. There is not much information available on the decomposition of materials buried in landfills; however, most packaging materials are not degradable. "Even paper, the most degradable of the major materials, has been reported to persist un-

changed in landfills for as long as 60 years." (The Role of Packaging in Solid Waste Management, 1966 to 1976, 1971, p. 21) It is hard to predict the time required for complete decomposition, since it is primarily dependent upon the moisture content of the soil, and generally takes place over a long period of time. (Sanitary Landfill Facts, 1970, p. 24)

Another problem connected with landfills, is that of settlement. Settlement of the landfill depends upon such factors as composition, moisture content, compaction of the material, and depth of the fill. "Studies have indicated that approximately 90 percent of the ultimate settlement will occur in the first five years. The final 10 percent will occur over a much longer period." (Sorg and Hickman, 1970, p. 24) This factor must be taken into consideration when planning the use of the completed landfill area.

There are three types of sanitary landfills: (1) area landfill; (2) trench landfill; and (3) ramp or slope. In an area landfill, waste is placed on the land, spread out and compacted. After compaction, wastes are covered with a thin layer of earth; following this the layer of earth is compacted. This type of landfill is best suited for use in flat or gently sloping areas. This method can also be used in such areas as valleys, ravines, or quarries.

The second method, the trench landfill, occurs when a trench is cut in the ground and wastes are put into it. The same process of spreading, compacting, and covering follow. This process is best suited for flat areas, and the earth from the trenches is usu-

ally adequate for covering. One disadvantage to this method is that it requires more than one piece of equipment.

The third method, the ramp or slope landfill is a variation of the two previous methods. This occurs when solid wastes are spread in thin layers on an existing slope. Again the same three steps of spreading, compacting and covering are used. The earth used in covering is usually obtained from the immediate area. This method is quite versatile and can be used in most areas. A special advantage to this method is that usually only one piece of equipment is needed, which makes this alternative enticing to a small operation site. (Sanitary Landfill Facts, 1970, p, 8-10)

There are many uses for the completed sanitary landfill. Landfills have been used for golf courses, parks, playgrounds, parking and storage areas, gardens, and in some cases for building sites. However, if the completed landfill is to be used as a building site, special precautions should be met. It is important for the designer to avoid concentrated foundation loading, which can result in uneven settling and cracking of the building. It is also important to provide a means for dissipating gases to enter the atmosphere rather than the structure. (Sorg and Hickman, 1970, p. 24)

The Environmental Protection Agency has the opinion that the sanitary landfill would be a good choice for disposal of solid wastes for the entire nation. "It is technologically and economically feasible now, and it can be employed by virtually all communities, whether rural or urban." (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 9)

Recycling

According to the Eliassen report, the best system of solid waste management, would be one which cuts down the disposal of wastes by reusing or recycling them. The word recycle is a relatively new word, which means that "... resources be used over and over again, thus reducing the drain upon natural resources and helping in the seemingly impossible task of disposing of solid garbage." (The Royal Bank of Canada Monthly Letter, Vol. 53, No. 8, 1972)

The amount of solid waste currently reclaimed is small. "Less than one third of the 43 million tons of paper products manufactured each year is recycled. Few of the 48 billion cans or 26 million bottles produced annually are reclaimed, and only about 10 percent of plastic and 15 percent of rubber are reclaimed." (Brubaker, 1972, p. 31) Since paper and paper products compose the largest segment of salvageable material in the United States' refuse, it seems that recycling and reuse of paper would be a "... sensible way to reduce waste, conserve valuable resources, and cut our waste disposal problems down to maneageable size." (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 10)

There is already a big business for reclaiming and recycling paper.

> In the paper industry, 58.5 million tons of paper and paperboard were recycled in 1969. Approximately 23 percent of all newsprint and 25 percent of corrugated boxes were collected for reuse. For every ton of paper reused, the taxpayer saves $25. Those who collect and sort old newspapers make about $25 million annually, saving about five million trees from the pulp mills. (Current Focus, 1971, p. 8)

There are pollution-free mills in New Jersey, California, and Illinois, where newsprint is recycled for local markets. More than 100 major companies now use recycled paper for stationery, bonds, books, forms, Xerox paper, tissues, cartons, towels, insulation etc. (House Beautiful, September 1972, p. 107)

A major problem in incorporating recycling into the solid waste disposal solution, is that of sorting and/or separating. The public does not want to be bothered with this process and it costs time and money when done by the collection agency. Currently there is not a practical system for separating, classifying, and decontaminating the fantastically "mixed bag" of solid waste after collection. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 10)

At present newsprint is the type of paper most often recycled. When newspapers enter homes they are usually kept separate from other garbage until they are discarded. (New Directions in Solid Wastes Processing, 1970, p. 43) Some communities take advantage of the ease of keeping newspapers separate. Irvington, New Jersey requires the citizens of the community to keep their newspapers separate. When garbage is collected, bundled newspapers left on the curb are collected by organizations of the community which benefit from their sale. The residents of Spotswood, New Jersey, separate newspapers from the rest of their garbage. The garbage trucks have cage-like containers on the front where newspapers are placed during the garbage collection to keep them separate from other solid waste. The city sells the newsprint for $8 a ton. (Compost Science:

Journal of Waste Recycling, March-April, 1972, p. 19)

Madison, Wisconsin also operates a newspaper collection service. The city collects bundled newspapers from the homes at a cost to the city of $2.50 a ton. They are sold to a salvage dealer for $7.00; thus a $4.50 profit is realized on each ton. The salvage dealer sells the newspapers to a papermaking plant, making a $5 to $10 profit on each ton sold. The papermaking plant makes its profit when it sells the recycled newsprint to the two publishers of Madison's newspapers. The newspapers save money by buying recycled newsprint ($170 ton compared to $175 for virgin newsprint). The people of Madison are donating their paper to the city rather than throwing it in the garbage, they then buy it back as newspapers. The arrangement amounts to an annual profit for Madison of $12,375. (Compost Science: Journal of Waste Recycling, May-June, 1972)

In many other communities newspapers are collected from homes by Boy Scouts, student groups, service and religious organizations. However, the success here is sporadic, as collection often depends on the weather. Another reason for its limited success is that often when a project is completed, the organization gives up interest in the collection service. (New Directions in Solid Wastes Processing, 1970, p. 40)

Recycling of newspapers is helping to reduce solid wastes and to preserve natural resources. Recycling helps to eliminate additional trees from being cut and processed. The Garden State Paper Company in Garfield, New Jersey recycles 600 tons of old newspapers

a day. The company estimates that for every ton of newsprint which is recycled 17 trees are saved. This means that ten thousand trees a day are being saved through the recycling done by this plant. (Common Carrier, The Salt Lake Tribune, Sunday, October 8, 1972, p. B7) On a yearly basis, this company saves 5,500,000 trees and eliminates much tonnage from solid waste disposal.

There have been other suggestions for using recycled paper. Experimental work is now being done on converting waste paper into cattle food. Insulation and other building materials are also being made from recycled paper. (Ellis et al., 1969, p. 31)

Although recycling appears to be a good solution to much of the waste paper problem there are problems in getting recycled paper accepted. The Government, the largest consumer in the United States, still refuses to use recycled paper because of the fear that it will yellow or fade faster than virgin paper. Another problem is convincing the general public that recycled paper is as clean as non-recycled. Despite the problems involved with recycling, more of it will be done in the future.

Paper Disposal in Logan City

Logan City uses a sanitary landfill for disposal of solid waste. The landfill is located two miles west of the city. Incineration is prohibited within city limits, consequently, almost all solid waste is picked up on the curb and taken to the landfill.

There is a recycling plant for newspapers located south of

Logan City. Individuals or organizations can take newspapers to the plant in small bundles. When large amounts of paper are taken to the plant the organization which collected the paper is paid $12 a ton. This method of fund raising is popular in Logan City. (Ashliman, 1973)

Waste Paper Solutions

Today, as we see evidence of our past errors accumulating all around us, new ideas of solid waste management are emerging. One involves controlling the quantity and characteristics of waste; recycling those that can be reused; and disposing in the proper way the waste that has no further use. (A Citizens' Solid Waste Management Project Mission 5000, 1972, p. 4)

In order to obtain these goals and objectives, each member of society must become actively involved by accepting his or her responsibilities. There are responsibilities which should be assumed by the government, public education, home economics, and families and individuals.

Government Responsibilities

Agencies of the Government are now actively involved in research and education about solid waste, including paper waste. However, much more support is needed. For example, Government offices could take the lead in accepting recycled paper as equal in quality to virgin paper. The Government could also take action to

impose taxes on all packages, or perhaps some kind of deterrent type tax when specific materials are used in packaging. (The Role of Packaging In Solid Waste Management 1966 to 1976, 1971, p. 27)

> Whatever approaches are taken, the objectives should be to: reduce the quantity of packaging material used, either by eliminating unnecessary packages or by encouraging more reuse and recycling; reduce destruction of natural resources; or reduce the technical difficulty involved in processing packaging wastes. (The Role of Packaging in Solid Waste Management 1966 to 1976, 1971, p. 25)

As the nation's largest consumer it is important that the Federal Government become involved.

Public Responsibilities

More than two-thirds of litter is some type of packaging. (Waste Not, Want Not, 1972, p. 1) If the public were to properly dispose of litter, a significant contribution to the solution of the solid waste problem would be made.

Citizens should also take the time to write letters to legislators and businessmen urging them to become involved in finding solutions to the problems of waste paper. It is also the responsibility of the public to be informed as to how solid waste is handled in their communities and to communicate with and vote for those who will help in finding solutions to solid waste problems. (House Beautiful, p. 107) Businesses and industries, as part of the public, must also become involved in the same ways. In addition they must assume responsibility for the impact that their own packaging, or use of non-packaging materials has on the environment. (The Packaging Industry and Government, 1971, p. 1)

Education's Responsibilities

William A. Steiger, Wisconsin Congressman, commented that people of America do not have a full understanding of their responsibilities concerning the environment. Because of this lack of understanding he feels it is important that the nation's people be made aware of "... their interdependence with the total environment and that they gain the knowledge and concern to begin finding solutions to current ecological imbalances and to prevent future ones... ." (Richardson, 1971, p. 18) Congressman Steiger feels that environmental education will improve the quality of peoples' lives by helping to improve the environment, as well as increase their appreciation of the life support systems which make life possible.

Because the public does not fully comprehend the problems at hand, it is essential that public information or education programs become a part of solid waste management. Through such programs, perhaps a new national commitment will come about. (Richardson, 1971, p. v) The full implications of environmental education are shown in the testimony of Margaret Mead, before the House Select Subcommittee on Education considering the Environmental Education Act of 1970:

> I think the best structure is the continuous participation of children and high school students and college students, but particularly school children in every community, because you have a new crop of them every year, and what we need to look at now are ways of providing regenerative cycles for dealing with problems that are going to be continuous... ." (Environmental Education--Education that Cannot Wait, 1971, p. 17)

A big challenge is thus given to formal education establish-

ments. The challenge is to create curriculum with current ecological content, presented in a way to meet the present high motivation of students. If this is to occur, schools will have to abandon the traditional classroom to encorporate all community resources in its curriculum. (Richardson, 1971, p. 24) If educators are not able to meet this need of today's active youth, "... then the nation must look on in dismay as highly active youth take to the streets in their frustration." (Richardson, 1971, p. 10)

Richard Nixon stated that it is vital that as a nation, we develop an understanding and awareness of our relationship with the environment. He points out that this "... will require the development and teaching of environmental concepts at every point in the educational process."

> A well-informed public can do much to help the smooth operation of a solid wastes service, particularly in regards to refuse collection and street cleansing. As is so often the case, the best and most successful results are achieved by training children. Well-presented lectures in schools and organized visits to refuse-disposal sites, with perhaps a chance to ride on one of the vehicles, can arouse in children an enthusiasm and an understanding that they will probably never forget. (Ellis et al., 1969, p. 38)

It seems, then, that any time, effort, or money which can be devoted to the education of the public in matters concerning solid waste disposal, and/or environmental issues, will be worthwhile. (Ellis et al., 1969, p. 38)

Home Economics' Responsibilities

Carolyn Hunt, in 1902 stated that "Teachers of home economics hold in their power, to an almost alarming extent, the control of

values." (Reprint of Revaluations, 1902, p. 12) If this is true, home economics teachers have the responsibility to instill in their students, values which will lead to an awareness of environmental problems in general and specifically those of solid waste. John Cantlon a noted ecologist, agrees with Hunt. As quoted by Hook and Paolucci:

> One example of a place to start would be to encourage the home economics curricula in the United States to adopt as a curricular focal point 'the home as an ecosystem.' Learning to think of each household as a system of inputs and losses of energy and materials would provide a means of relating to the larger urban and rural ecosystems. ... Learning what affects the health of the ecosystems that sustain and inspire him may make him a better informed voting citizen. (1970)

Home economics teachers could make students aware of the solid waste problem, and how individual and family practices affect it. This would be one step to the goal of creating citizen awareness regarding environmental problems.

Responsibilities of Families and Individuals

"Leadership and action at the national level are important. But our country is so vast and varied that simple, blanket solutions to its problems by the federal government are seldom effective. Environment conditions have to be faced where people live." (Harrington et al., 1970, p. 8)

Changing family buying habits could reduce the amounts of solid waste. Examples might be: not buying more packaging than is needed; buying returnable containers; buying products in economy sizes; reusing packaging in its original form; using cloth, not paper tow-

els, napkins, diapers; recycling newspapers, passing along magazines, and returning phone books to the phone company. (Recycling: A Broken Merry Go Round? 1972, p. 107)

It is vital that each individual make decisions which reflect an understanding of environmental problems on everyday matters, which together, become national problems or answers. (Richardson, 1971, p. 4) We must become aware of the problems around us, and of ways which we, individually can work to solve them. For some this will require a major reorientation to life. Major General Ross Ayers, Adjutant General of the State of Texas provides an example of action which can be taken on the individual level.

> I decided that an individual effort was needed by everyone in order to prevent a complete inundation of litter. So I promised myself that I would pick up one beer can, or bottle, or paper cup, each day, and that once a year I would go out and pick up a bushel of litter, and for the past 24 years I have kept that promise. (Licking Litter Problems, January, 1973)

Summary

There is a challenge in finding good ways to take care of solid waste. The possibility of getting people to stop creating so much may be a part, but first of all, people must become aware of the total problem.

President Nixon, emphasized the importance of this concern in his introductory remarks to the First Annual Report of the Council on Environmental Quality. He stressed the fact that concern with out natural environment is important to young and old. "For the

young, it has a special urgency. They know that it involves not only our own lives now but the future of mankind." For parents, it also has a special poignancy, for they are the first generation to actually feel repercussions of the past solid waste disposal habits.

President Nixon, feels that the heart of environmental concern is concern for human conditions, for the welfare of man now, as well as for the future. It is important to set a goal to not only remedy the damage of decades past, but "We should strive for an environment that not only sustains life but enriches life, harmonizing the words of man and nature for the greater good of all. (Richardson, 1971, p. 18-19)

METHODS AND PROCEDURES

Sample

The sample was comprised of 42 Logan City families, each of which included a father, mother and three children living at home. The father was employed full time. Each family was contacted by the researcher to ascertain if it met the criteria, were apprized of the purpose and scope of the study, and were asked for their cooperation in the study. All families who were contacted were interested and considerate, and all who met the above criteria agreed to help.

Pretest

A questionnaire was administered to three families. As a result of the pretest analysis changes were made in two of the original questions.

Study Instruments

A 22 item information questionnaire, along with an instruction sheet and the researcher's self-addressed stamped envelope was given to each family. The families were asked to mail their completed questionnaires to the researcher. The purpose of the questionnaire was to obtain a description of the sample and to determine some of their family conditions and practices.

A six item post questionnaire was mailed to each family with the researcher's self addressed stamped envelope. The purpose of the post questionnaire was to determine attitude changes of the families.

Procedure

The families who participated in the study were families known personally by the researcher or who were referred to her by others as families who met the criteria which had been established. It was not possible to use a random sample. The families who participated in the study were initially contacted by telephone. All the families contacted were very willing to help both by participating as part of the sample, and by offering names of others who might help. Of 63 families contacted, all who met the criteria agreed to participate; 50 were chosen. Eight of the original 50 families were dropped from the study for various reasons.

Families were asked to save all waste paper which they would normally discard during the weeks February 10 to and including February 16, and February 24 to and including March 2. Newspapers were kept separate from other waste paper. On February 8 and 9 the researcher visited each family to deliver the questionnaire, instruction sheet, and three 26-gallon capacity plastic bags for storing the waste paper. During the first week, six homemakers called the researcher to ask specific questions regarding procedures. At the end of the seven-day period the waste paper was col-

lected, labeled with numbers which had been pre-assigned to each family and weighed on scales which weighed to the half ounce. The seven families who discarded the most waste paper, or 16.6 percent of the total sample were selected as high waste paper output families. The seven families who discarded the least waste paper, or 16.6 percent were selected as low waste paper output families. After being weighed, newspapers were donated to a school recycling project in Salt Lake City, and the remaining waste paper was taken to the Logan City Sanitary Landfill by prior arrangement with Roger Stephens, Chief Sanitarian of Logan City Health Department. When the first week's paper was collected, additional plastic bags were given to each family for the second one-week period. After the second one-week period, the same procedure was followed in collecting and disposing of paper.

A post questionnaire was mailed to the 42 families who completed the study. The questionnaire was designed to determine attitude changes of the families who participated in the study.

After the study was completed an information sheet listing weights of the first and second week's paper, in addition to total weights, and averages, was mailed to all participating families. Each family was informed of its rank in the study.

Analysis of Data

Paper output of all families was weighed to determine:

(1) weight of newspapers per family

(2) weight of all other paper discarded per family

(3) total paper output by weight per family

(4) total paper output by weight per person

(5) total weight of newspapers for all families

(6) total weight of all other paper discarded for all families

(7) total paper output by weight for all families

Paper output of high paper output families was weighed to determine:

(1) weight of newspapers per family

(2) weight of all other paper discarded per family

(3) total paper output by weight per family

(4) total paper output by weight per person

(5) total weight of newspapers for all families

(6) total weight of all other paper discarded for all families

(7) total paper output by weight for all families

Paper output of low paper output families was weighed to determine:

(1) weight of newspapers per family

(2) weight of all other paper discarded per family

(3) total paper output by weight per family

(4) total paper output by weight per person

(5) total weight of newspapers for all families

(6) total weight of all other paper discarded for all families

(7) total paper output by weight for all families

RESULTS AND DISCUSSION

The present investigation was designed to determine the amount of paper a family of five discards during two seven-day periods, and from the sample, select a high paper output category and a low paper output category. The two categories were selected for comparison purposes to consider whether factors such as home gardening, home canning and preservation, stage of family life cycle, income, occupation of father, whether or not mothers works, and method of disposing of newspapers and magazines, have a cause/effect relationship on the amount of waste paper. For two seven-day periods the 42 participating families saved all paper which normally would be discarded. This paper was then collected and weighed.

Sample

Fifty families agreed to cooperate in the study. Of the original fifty, eight were dropped from the study for various reasons. All the families contacted were very cooperative. They were interested in the current study, and in the connection it had with an exploratory study conducted by Latham in 1972. Most of the participating families requested resultive information, which was sent to them at the conclusion of the study.

Ages of Family Members

Ages of fathers ranged from the 25 - 29 year old category to the 50 plus category. The average age category was 30 - 34, which was also the category in which the mode fell. (Table 2)

Ages of fathers in the high paper output category ranged from the 30 - 34 category to the 45 - 49 category. The average age category was 30 - 34, which was also the category in which the mode fell. Ages of fathers in the low paper output category ranged from the 25 - 29 category to the 40 - 44 category. The average age category was 30 - 34. (Table 2)

Table 2. Ages of fathers

Age Category	No. of Sample	% of Sample	No High	% High	No. Low	% Low
Under 25	0	0	0	0	0	0
25 - 29	3	7	0	0	2	29
30 - 34	18	43	4	57	2	29
35 - 39	11	26	2	29	2	29
40 - 44	4	10	0	0	1	13
45 - 49	3	7	1	14	0	0
50 plus	3	7	0	0	0	0
TOTALS	42	100	7	100	7	100

Ages of mothers ranged from the 25 - 29 category to the 45 - 49 category. The average age category was 30 - 34, which was also the category in which the mode fell. (Table 3)

Ages of mothers in the high paper output category ranged from 30 - 34 to 40 - 44. The average category was 30 - 34, which was also the category in which the mode fell. Ages of mothers in the low paper output category ranged from 25 - 29 to 35 - 39. The average age category was 25 - 29, which was also where the mode fell. (Table 3)

Table 3.

Ages of mothers

Age Category	No. Sample	% Sample	No. High	% High	No. Low	% Low
Under 25	0	0	0	0	0	0
25 - 29	9	21	0	0	4	57
30 - 34	21	50	4	57	2	29
35 - 39	4	10	2	29	1	14
40 - 44	5	12	1	14	0	0
45 - 49	3	7	0	0	0	0
50 plus	0	0	0	0	0	0
TOTALS	42	100	7	100	7	100

There were 126 children in the 42 sample families. Childrens' ages ranged from 6 months to 25 years. Families could have been larger at some time in the past, but at the time of the study only three children were living in each home. The average ages of the youngest, middle and oldest child were 4, 7, and 10 years respectively. (Table 4)

There were 21 children in both the high paper and the low paper output families. In the high paper output category the children's ages ranged from 2 to 17 years. The average ages for the youngest, middle and oldest child respectively were 5, 9, and 11. (Table 4) In the low paper output category childrens' ages ranged from 6 months to 10 years. The average ages for the youngest, middle, and oldest child respectively were 2, 5, and 7. (Table 4)

Table 4. Ages of children

Ages	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 5	54	43	7	33	13	62
6 - 11	48	38	9	43	8	38
12 - 17	21	17	5	24	0	0
18 - 25	3	2	0	0	0	0
TOTALS	126	100	21	100	21	100

Occupation of the Father

Occupations of the fathers were divided into three categories: (1) professional, including those occupations requiring an education beyond high school (ie. educator, engineer, accountant, etc.); (2) laborer (ie. truck driver, general laborer, etc.); and (3) salesman. (Table 5)

Table 5. Occupations of father

Occupations	No. Total	% Total	No. High	% High	No. Low	% Low
Professional	32	76	7	100	4	57
Laborers	4	10	0	0	1	14
Salesmen	6	14	0	0	2	29
TOTALS	42	100	7	100	7	100

Of those families included in the high paper output category, 100 percent of the fathers were professionals. Fifty-seven percent of the fathers in the low paper output category were professionals.

Employment of Mothers

In the total sample, five mothers, or 12 percent were employed; two were employed full time, and three were employed part time. Of the five mothers, three were laborers, and two were professionals. In the high paper output category, two mothers, or 29 percent,

were employed; one part time, and one full time. Both of these mothers were professionals. In the low paper output category, one mother, or 14 percent was employed. This mother was employed full time as a laborer.

Combined Family Income

The average income category of the sample was $10,000 - 11,999. The mode fell in the $12,000 and above category. (Table 6) In the high paper output category six of the seven, or 86 percent of the sample had incomes of $12,000 and above. In the low paper output category five of the seven, or 71 percent of the families had incomes less than $12,000. (Table 6)

Table 6. Family income distribution

Income Level	No. Sample	% Sample	No. High	% High	No. Low	% Low
Under $4,999	0	0	0	0	0	0
5,000 - 7,999	2	5	1	14	0	0
8,000 - 9,999	5	12	0	0	3	42
10,000 - 11,999	6	14	0	0	2	29
Above 12,000	29	69	6	86	2	29
TOTALS	42	100	7	100	7	100

Education of Parents

All fathers had completed high school. Three fathers, or seven percent of the total sample had no further education. Seven fathers or 17 percent of the total sample had between one and three years of college, and 32 fathers, or 76 percent of the total sample had four years or more of college. (Table 7) In the high paper output category six of the seven fathers or 86 percent had six or more years of college. Five of these six had Ph.D's. The remain-

ing father had four years of college. In the low paper output category five of the seven fathers or 71 percent of the sample had four or more years of college. Two fathers, or 29 percent had between one and three years of college, and the remaining father had completed high school. (Table 7)

Table 7. Education of fathers

Education	No. Sample	% Sample	No. High	% High	No. Low	% Low
high school	3	7	0	0	1	14
1-3 yrs. col.	7	17	0	0	2	29
4 or more yrs. of college	32	76	7	100	4	71
TOTAL	42	100	7	100	7	100

All of the 42 mothers had completed high school. Seven mothers, or 17 percent of the sample had no further education. Sixteen mothers, or 38 percent of the sample had between one and three years of college. Eighteen mothers, or 43 percent of the sample had completed four or more years of college. Two mothers, or five percent had received between one and three years of other post high school training. (Table 8) In the high paper output category four mothers, or 57 percent of the sample had between one and three years of college. Three mothers, or 43 percent, had completed four or more years of college. In the low paper output category one mother had completed high school. Two mothers, or 29 percent of the sample had completed between one and three years of college, and four mothers, or 57 percent had completed four or more years of college. (Table 8)

Table 8. Education of mothers

Education	No. Sample	% Sample	No. High	% High	No. Low	% Low
high school	7	17	0	0	1	14
1-3 yrs. col.	16	38	4	57	2	29
1-3 yrs. other training	2	5	0	0	0	0
4 or more yrs. of college	18	43	3	43	4	57
TOTALS	43*	103*	7	100	7	100

*One mother had between one and three years of college, in addition to between one and three years of other training.

The average father in the sample had six years of college. The average father in the high paper output category had six years of college, and the average father in the low paper output category had four years of college. The average mother in the sample had three years of education past the high school level. In the high paper output category the average was three years past high school, and in the low paper output category the average was 2.5 years beyond the high school level.

Results

Paper waste was collected from each of the 42 families comprising the sample and was weighed to the half ounce. Table 9 indicates average weights per family for the various types of paper waste collected. Table 9 also indicates average weights in the high paper output category, and in the low paper output category.

Table 9.

Paper waste averages

Item	Total Sample		High		Low	
	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.
newspapers	4	14	15	9	0	0
other paper	14	3	22	2	9	3
total paper	18	12	37	11	9	3

Table 10 indicates paper weight of newspapers, other waste, and total paper waste by each family.

During the first week the highest total weight of 21 pounds 3 ounces was collected from family number 42 and the lowest weight of 2 pounds 12 ounces from family number 2. During the second week period the highest total weight of 41 pounds 2 ounces was again collected from family number 42. The lowest weight for the second week period came from family number one, with 4 pounds. Family number 42 had the highest total weight of 62 pounds 5 ounces. Family number one had the lowest two-week total of 7 pounds 15 ounces. The total paper waste collected from the 42 families was 801 pounds 12 ounces,

Table 10. WASTE PAPER OUTPUT

Family No.	First Week						Second Week						Total					
	newspapers		other		total		newspapers		other		total		newspapers		other		total	
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
1.	0	0	3	15	3	15	0	0	4	0	4	0	0	0	7	15	7	15
2.	0	0	2	12	2	12	0	0	5	4	5	4	0	0	8	0	8	0
3.	0	0	3	13	3	13	0	0	4	9	4	9	0	0	8	6	8	6
4.	0	0	4	12	4	12	0	0	4	15	4	15	0	0	9	11	9	11
5.	0	0	4	8	4	8	0	0	5	4	5	4	0	0	9	12	9	12
6.	0	0	4	6	4	6	0	0	5	13	5	13	0	0	10	3	10	3
7.	0	0	4	12	4	12	0	0	5	9	5	9	0	0	10	5	10	5
8.	0	0	5	3	5	3	0	0	5	14	5	14	0	0	11	1	11	1
9.	0	0	6	1	6	1	0	0	5	7	5	7	0	0	11	8	11	8
10.	0	0	4	9	4	9	0	0	7	4	7	4	0	0	11	13	11	13
11.	0	0	3	13	3	13	0	0	8	2	8	2	0	0	11	15	11	15
12.	0	0	5	14	5	14	0	0	6	1	6	1	0	0	11	15	11	15
13.	0	0	5	8	5	8	0	0	6	8	6	8	0	0	12	0	12	0
14.	0	0	7	13	7	13	0	0	4	12	4	12	0	0	12	9	12	9
15.	2	15	6	4	9	3	0	0	4	6	4	6	2	15	10	10	13	9
16.	0	0	6	4	6	4	0	0	7	6	7	6	0	0	13	10	13	10
17.	0	0	7	2	7	2	0	0	7	1	7	1	0	0	14	3	14	3
18.	0	0	7	0	7	0	0	0	7	4	7	4	0	0	14	4	14	4
19.	2	4	5	6	7	8	2	2	5	2	7	4	4	6	10	6	14	12
20.	0	0	6	8	6	8	0	0	8	6	8	6	0	0	14	14	14	14
21.	0	0	7	14	7	14	0	0	7	3	7	3	0	0	15	1	15	1
22.	0	0	10	0	10	0	4	11	1	5	6	10	4	11	11	15	16	10
23.	0	0	7	9	7	9	0	0	9	2	9	2	0	0	16	11	16	11
24.	0	0	6	11	6	11	0	0	10	2	10	2	0	0	16	13	16	13
25.	0	0	7	9	7	9	0	0	9	6	9	6	0	0	16	15	16	15
26.	0	0	8	11	8	11	0	0	8	9	8	9	0	0	17	4	17	4
27.	0	0	8	6	8	6	0	0	9	3	9	3	0	0	17	9	17	9
28.	4	14	7	8	12	0	0	0	5	15	5	15	4	14	13	1	17	15
29.	0	0	10	4	10	4	0	0	9	8	9	8	0	0	19	12	19	12
30.	1	10	8	6	10	0	0	0	9	12	9	12	1	10	18	2	19	12
31.	0	0	9	4	9	4	0	0	12	12	12	12	0	0	22	0	22	0
32.	0	0	11	0	11	0	0	0	12	1	12	1	0	0	23	1	23	1
33.	0	0	12	12	12	12	3	6	6	15	10	5	3	6	19	11	23	1
34.	0	0	10	6	10	6	0	0	13	1	13	1	0	0	23	7	23	7
35.	10	11	6	0	16	11	3	13	5	9	9	6	14	7	11	10	26	1
36.	5	12	6	13	12	9	8	10	7	9	16	3	14	6	14	6	28	12
37.	4	12	9	9	14	5	4	10	12	14	17	8	9	6	22	7	31	13
38.	0	0	14	4	14	4	5	7	12	8	17	15	5	7	26	12	32	3
39.	6	12	8	4	15	0	11	15	5	5	17	4	18	11	13	9	32	4
40.	0	0	20	11	20	11	9	2	8	2	17	4	9	2	28	13	37	15
41.	0	0	18	5	18	5	15	2	5	3	20	5	15	2	13	8	38	10
42.	10	7	10	12	21	3	26	12	14	6	41	2	37	3	25	2	62	5

which represents an average of 18 pounds 12 ounces per family for 14 days or 1 pound 5 ounces per family per day and 4.2 ounces per person per day.

During the first week the amount of paper collected from families in the high paper output category ranged from 12 pounds 9 ounces to 21 pounds 3 ounces. During the second week the range was 16 pounds 3 ounces to 41 pounds 2 ounces. The total paper waste collected from the seven families in the high paper output category was 263 pounds 14 ounces, which represents an average of 37 pounds 11 ounces per family for a 14 day period, or 2 pounds 11 ounces per family per day and 8.6 ounces per person per day.

During the first week the amount of paper collected from families in the low paper output category ranged from 2 pounds 12 ounces to 5 pounds 3 ounces. During the second week the range was from 4 pounds to 5 pounds 14 ounces. The total paper waste collected from the seven families in the low paper output category was 64 pounds 5 ounces, which represents an average of 9 pounds 3 ounces per family for a 14 day period, or 10.4 ounces per family per day and 2.08 ounces per person per day.

When comparing the high paper output category totals with the low paper output category totals one finds the high paper output category having 199 pounds 9 ounces more in total weight, 28 pounds 8 ounces more per family for 14 days, and 2 pounds 0.6 ounces more per family per day and 6.52 ounces more per day per person. (Table 11)

Table 11. Differences between high and low categories

	High		Low		Difference	
	lb.	oz.	lb.	oz.	lb.	oz.
Total weight	263	14.00	64	5.00	199	9.00
Family/14 days	37	11.00	9	3.00	28	8.00
Family/day	2	11.00		10.40	2	0.60
Person/day		8.60		2.08		6.52

Subscription to Newspapers and Magazines

All sample families subscribed to at least one newspaper. Twenty-two families or 52 percent of the sample subscribed to two newspapers, and three families or seven percent of the sample subscribed to three newspapers. (Table 12) In the high paper output category five of the seven families or 71 percent subscribed to two newspapers. Two families, or 29 percent subscribed to one newspaper. (Table 12) In the low paper output category four families, or 57 percent of the sample subscribed to two newspapers. Three families, or 43 percent subscribed to one newspaper. (Table 12)

Table 12. Subscription to newspapers

Newspapers	No. Sample	% Sample	No. High	% High	No. Low	% Low
1	17	40	2	29	3	43
2	22	52	5	71	4	57
3	3	8	0	0	0	0
TOTALS	42	100	7	100	7	100

The average family in the sample subscribed to 1.6 newspapers. The average family in the high paper output category subscribed to 1.7 newspapers, and the average low paper output category subscribed to 1.6 newspapers.

All families subscribed to at least two magazines. Twenty families, or 48 percent of the sample subscribed to five or fewer magazines.

Eighteen families, or 43 percent of the sample subscribed to 6-10 magazines. Four families, or 9 percent of the sample subscribed to more than 10 magazines. One family subscribed to 22 magazines. (Table 13)

In the high paper output category three families, or 43 percent of the sample subscribed to less than five magazines. Three families, or 43 percent of the sample subscribed to 6-10 magazines. The remaining family, 14 percent of the sample, subscribed to more than ten magazines. (Table 13) In the low paper output category four families, or 57 percent of the sample subscribed to less than five magazines. Three of the families, or 43 percent of the sample subscribed to 6-10 magazines. (Table 13)

Table 13. Subscription to magazines

Magazines	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 5	20	48	3	43	4	57
6 - 10	18	43	3	43	3	43
10 plus	4	9	1	14	0	0
TOTALS	42	100	7	100	7	100

The average family in the total study subscribed to eight magazines. The average family in the high paper output category subscribed to 6.5 magazines, and the average family in the low paper output category subscribed to six magazines.

Home Gardens and Food Preservation

Seventeen families or 40 percent of the total sample raised gardens. In the high paper output category, two families, or 29 percent had home gardens. In the low paper output category, two families, or 29 percent had home gardens. (Table 14)

Table 14. Home gardens

	No. Sample	% Sample	No. High	% High	No. Low	% Low
YES	17	40	2	29	2	29
NO	25	60	5	71	5	71
TOTALS	42	100	7	100	7	100

Thirty-six families or 86 percent of the total sample do some food preservation. In the high paper output category, four families, or 57 percent do home preserving, while in the low paper output category, five families or 71 percent do home preserving.

The families were each asked to estimate what percentage of fruit; vegetables; meats; juices; pickles, olives, etc.; and jams, jellies, etc.; they preserved at home. (Tables 15 - 20)

Table 15. Fruits preserved at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	13	31	3	43	4	58
21 - 40	2	5	0	0	1	14
41 - 60	6	14	0	0	0	0
61 - 80	7	17	1	14	1	14
81 - 100	10	24	3	43	0	0
undeclared	4	9	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the study preserved 41 - 60 percent of their fruit. The average family in the high paper output category preserved 41 - 60 percent of their fruit. The average family in the low paper output category preserved 0 - 20 percent of their fruit.

Table 16. Vegetables preserved at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	25	60	5	72	5	72
21 - 40	2	5	0	0	0	0
41 - 60	2	5	0	0	0	0
61 - 80	5	12	1	14	0	0
81 - 100	5	12	1	14	1	14
undeclared	4	9	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the study preserved 21 - 40 percent of their vegetables. The average family in the high paper output category preserved 21 - 40 percent of their vegetables. The average family in the low paper output category preserved 0 to 20 percent.

Table 17. Meats processed at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	30	71	5	72	4	58
21 - 40	0	0	0	0	0	0
41 - 60	2	5	1	14	1	14
61 - 80	3	7	0	0	1	14
81 - 100	3	7	1	14	0	0
undeclared	4	10	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the total sample processed 0 - 20 percent of their meat. The average family in both the high paper output category and the low paper output category also processed 0 - 20 percent of their meat.

Table 18. Juices preserved at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	30	71	5	72	4	58
21 - 40	0	0	0	0	0	0
41 - 60	2	5	1	14	1	14
61 - 80	3	7	0	0	1	14
81 - 100	3	7	1	14	0	0
undeclared	4	10	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the sample preserved 0 - 20 percent of their juices. The average families in both the high paper output category and the low paper output category preserved 0 - 21 percent of their juices.

Table 19. Pickles, olives, etc., preserved at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	19	45	5	71	4	58
21 - 40	1	3	0	0	0	0
41 - 60	4	10	0	0	1	14
61 - 80	1	3	0	0	0	0
81 - 100	12	29	2	29	1	14
undeclared	4	10	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the total study preserved 21 - 40 percent of their pickles, olives, etc. The average family in the high paper output category preserved 21 - 40 percent, and the average low paper output category preserved 0 - 20 percent of their pickles, olives, etc.

Table 20. Jams, jellies, etc. preserved at home

Percent	No. Sample	% Sample	No. High	% High	No. Low	% Low
0 - 20	12	29	5	71	2	29
21 - 40	0	0	0	0	0	0
41 - 60	1	2	0	0	0	0
61 - 80	5	12	0	0	0	0
81 - 100	20	48	2	29	4	57
undeclared	4	10	0	0	1	14
TOTALS	42	100	7	100	7	100

The average family in the sample preserved 41 - 60 percent of their jams, jellies, etc. The average family in the high paper output category preserved 21 - 40 percent of their jams, jellies, etc. at home, while the average family in the low paper output category preserved 41 - 60 percent.

Fishing and Hunting

Eighteen families, or 43 percent of the sample did some fishing. However, most of this meat was used fresh; only a small part was preserved. Eleven families, or 26 percent of the sample hunted for game birds; again the amount which was preserved was not great. Fourteen families, or 33 percent of the sample hunted for large game. Of these 13 families, ten did not preserve any. One family used this meat for ten percent of their total meat supply; one family used this meat for 40 percent of their total meat supply, and two families used this meat for 50 percent of their total meat supply.

In the high paper output category, only one family hunted for large game and this comprised 10 percent of their total meat supply. Three families hunted for game birds, and two families fished.

In the low paper output category, three families hunted for large game, however, only one family used this as a primary source of meat. Two of the families hunted for game birds, and two families fished.

Grocery Shopping

Twenty seven families, or 64 percent of the sample shopped for groceries once a week. In the high paper output category, two families or 29 percent shopped for groceries once a week, while in the low paper output category six families or 86 percent shopped once a week. (Table 21)

Table 21. Frequency of grocery shopping

Frequency	No. Sample	% Sample	No. High	% High	No. Low	% Low
once/wk +	6	14	2	29	0	0
once/wk	27	64	2	29	6	86
evry 2 wks	4	10	0	0	0	0
evry 3 wks	1	2	0	0	0	0
monthly	4	10	3	42	1	14
TOTALS	42	100	7	100	7	100

Type of Milk Containers

Twenty one families in the sample purchased their milk in cartons. Of these, six families were in the high paper output category, and two families were in the low paper output category. Twenty three families in the sample purchased their milk in bottles. Two of these families were in the high paper output category, and five families were in the low paper output category. Four families mixed their milk from powdered milk. One family was in the low paper output

category. Some of the families obtained their milk in more than one way. (Table 22)

Table 22. Type of milk container

Type	No. Sample	% Sample	No. High	% High	No. Low	% Low
cartons	21	50	6	86	2	29
bottles	23	57	2	29	5	71
other	4	10	0	0	1	14
TOTALS	48*	117	8*	115*	8*	114*

*Some families obtained their milk in more than one way.

Specific Paper Items

Paper tissues (Kleenex, etc.) were used always by 81 percent of the sample. Sixty-two percent of the sample used paper towels always. Paper plates and cups were seldom used by most families. Twenty-nine percent seldom used paper table cloths, the remaining 71 percent had never used them. Only 10 percent of the sample always used disposable diapers and 67 percent had never used them. One family always used paper dish cloths, one family often used them, two families seldom used them, and 38 families or 90 percent of the sample had never used them. Seventy one percent of the sample had never used paper place mats, 26 percent seldom used them, and three percent or one family used them often. Forty eight percent of the sample always used paper napkins. Forty three percent often used paper napkins, and nine percent seldom used them. (Table 23)

There were no great differences in the use of the specific products by families in the high paper output category and in the low paper output category.

Table 23.

Specific paper products				
Item	always	often	seldom	never
Paper tissues	33	6	3	0
Paper towels	27	14	1	0
Paper plates	1	7	33	1
Paper cups	0	12	30	0
Paper table cloths	0	0	12	30
Disposable diapers	3	0	10	29
Dish cloths	1	1	3	37
Place mats	0	2	10	30
Napkins	20	18	4	0
Scratch paper &/or type paper	20	20	2	0
TOTALS	105	80	108	127

Testing of Objectives

Objective one: The first objective of this study was to determine whether family conditions and practices such as home gardening, home canning and preservation, stage of the family life cycle, occupation of father, employment of mother, and method of disposing of newspapers and magazines, affected the amount of waste paper output in households. For purposes of comparison, the seven families with the highest waste paper output, or 16.6 percent of the sample, were designated high paper output families and the seven families, with the lowest waste paper output, or 16.6 percent of the sample, were designated low paper output families.

When comparing the families in the high paper output category with those in the low paper output category, the following conclusions were made about family conditions and practices related to waste paper output.

(1) There were two families in the high paper output category and two in the low paper output category who raised home gar-

dens. Home gardening did not seem to have an influence on waste paper output.

(2) In comparing the amount of food preservation done by high and low categories, there seemed to be no great difference except in fruit. In this area, there would be very little paper involved. Home preservation did not seem to have an influence on waste paper output.

(3) All families in both groups were relatively young families; although the fathers, mothers, and children in the high paper output category were slightly older than the low category. Stage of family life cycle did not seem to have an influence on waste paper output.

(4) One hundred percent of the fathers in the high paper output category were professionals. In the low paper output group, 57 percent were professional, 14 percent were laborers, and 29 percent were salesmen. Occupation of father may have been an influencing factor. However, because of the large number of professionals in the sample this is difficult to determine.

(5) In the high paper output category two mothers, or 29 percent of the sample, were employed. One mother was employed full time, the other part time. Both were professionals. In the low paper category one mother, or 14 percent of the sample was employed full time as a laborer. Employment of mothers did not seem to have an influence on waste paper output.

(6) Number of subscriptions to newspapers seemed to have had no influence on waste paper output; however, the method of disposal seemed to be a very important factor in determining the amount of waste paper output. In the high paper output category, seven families, or

100 percent threw their newspapers in the trash. In the low paper output category, none of the families threw newspapers in the trash during the two one-week periods. This seemed to be the major practice which had an effect on the total paper output.

(7) In the high paper output category 46 magazines entered the seven homes. During the study none were discarded. In the low paper output category 42 magazines entered the seven homes. During the study none were discarded. Number of subscriptions to magazines seemed to have had no influence on waste paper output. Means of disposal (trash, given away, or saved) may have an influence; however since there were no magazines thrown away from the high and low categories this could not be measured.

Objective two: The second objective was to determine the effect of income on waste paper output. In comparing income to the amount of paper discarded by the families in the high paper output category, 86 percent of the entire sample fell in the $12,000 and above category and one family or 14 percent fell in the $5,000 to $7,999 category. Forty-two percent of the low paper output families fell in the $8,000 to 9,999 category, 29 percent fell in the $10,000 - 11,999 category, and 29 percent fell in the $12,000 and above category. Income seemed to be related to waste paper output. The high paper output category had 199 pounds 9 ounces more in total weight, 28 pounds 8 ounces more per family for 14 days, 2 pounds 0.6 ounces more per family per day and 6.52 more ounces per day per person.

Post Questionnaire

A post questionnaire was mailed to each participant to determine some of their attitudes toward the study. Question number one asked whether the families were more aware now of the paper products which they used or discarded since participating in the study. Eighty six percent of the total sample and eighty six percent of the high category and the low category answered affirmatively. Question number two asked if they thought there was a waste paper problem in Logan City. Thirty percent of the total sample thought there was a problem, 14 percent of the high category and 29 percent of the low category. The third question asked if they were surprised at the amount of waste paper which they had accumulated during a one-week period. Forty three percent of the total sample was surprised, while 100 percent of the high category and 86 percent of the low category were surprised.

Question number four asked the participants if they could identify one way in which they could cut down on their waste paper, and if they would consider doing it. Sixty seven percent could identify at least one way. Answers given included recycling newspapers, using fewer tissues, paper towels, cups, plates, napkins, not using disposable diapers, buying milk in bottles rather than cartons, and planning menus better, in order to go shopping less. Two families in the high category listed recycling of newspapers as a way of eliminating some waste paper. Some expressed hesitancy in actually doing these things.

SUMMARY AND CONCLUSIONS

Paper waste discarded by families of five persons in Logan City was investigated. The research was a follow-up study of Latham's study in 1972. The purpose was to determine whether certain family conditions and practices had an affect on the amount of waste paper output.

The sample was composed of 42 Logan City families comprised of a father working full time, mother, and three children living in the home. From the total sample, seven families or 16.6 percent who had the highest two-week total paper output and seven with the lowest two-week paper output were selected for comparisons.

The average weight of waste paper for the total sample was 18 pounds 12 ounces for two weeks. The average weights for the high and low categories respectively, were 37 pounds 11 ounces, and 9 pounds 3 ounces for 14 days.

In testing the objectives, the following conclusions may be drawn:

1. Participants in this study had a low waste paper output compared to nation wide estimates. An estimate of the national average of total solid waste in the United States is 5.3 pounds per person per day, approximately one half of this, or 2.65 pounds is paper. In this study the average person discarded 4.2 ounces of waste paper per day.

2. Home gardening seemed to have no effect on paper output.

3. Home food preservation seemed to have no effect on paper output.

4. Stage of family life cycle seemed to have no effect on paper output.

5. Occupation of father seemed to have no effect on amount of paper output, however; because of the large number of professionals in the sample this is difficult to determine.

6. Employment of mother seemed to have no effect on paper output; however, because of the limited number of working mothers in the sample this is difficult to determine.

7. Method of disposing of newspapers had an effect on waste paper output.

8. Number of magazine subscriptions seemed to have no effect on waste paper output.

9. Amount of income seemed to have an effect on waste paper output.

Recommendations

It is recommended that a similar study be conducted concerning paper waste output considering the following factors:

1. A sampling of paper waste discarded at various times of the year would indicate variations due to seasonal differences and family activities.

2. A larger sample would give a broader and more comprehensive view of paper waste discards.

3. A sample with a wider variety of occupations would give a broader and more comprehensive view of paper waste discards.

4. A study conducted in other areas of the United States would indicate geographical differences of paper waste discards.

5. A study designed for determining whether low paper output causes high output of other components of solid waste.

6. Income categories should be broken down above the $12,000 level rather than using this as the top category.

7. A question to determine whether the participants were from an urban or rural background may show some trend in regard to home canning and food preservation.

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APPENDIX

INSTRUCTIONS

Please fill out your questionnaire and mail it to me today. Your saving paper will be of no value unless I have the questionnaire.

Please save your paper:

Sat., February 10, to and including Fri., February 16.

AND

Sat., February 24, to and including Fri., March 2.

I will pick up the paper on:

Sat., February 17.

AND

Sat., March 3.

(If you will not be at home, please leave the paper on your porch or in your drive way. If this is not possible, please call me.)

When I pick up the paper on Saturday, February 17, I will also leave bags for the second week period.

Please put newspapers and magazines in a separate bag than other waste paper. (If you already give these to a group for fund raising projects, I do not want them.)

If you use disposable diapers just keep track of the number of diapers you use during the week. (Please estimate this number and include on the questionnaire. At the end of the week if there is a wide discrepancy between your estimated number and the actual one, please let me know.)

Please remember to save only that paper which you would normally throw away. (i.e. labels, boxes, sacks, paper towels, napkins, tissues, junk mail, etc.)

Thank you very much for your help and cooperation. If you have any questions please call me at any time.

Dena Lee Call
181 East 10 North #5
752-3521

QUESTIONNAIRE

1. Name of Father_____

2. Address_____

3. Age of Father

_____Under 25

_____25 - 29

_____30 - 34

_____35 - 39

_____40 - 44

_____45 - 49

_____50 and above

4. Age of Mother

_____Under 25

_____25 - 29

_____30 - 34

_____35 - 39

_____40 - 44

_____45 - 49

_____50 and above

5. Ages of children _____ _____ _____

6. Occupation of father_____

7. Is mother employed outside of home? yes_____ no_____

part time_____ full time_____

occupation_____

8. Education of father:

grade school_____ No. of years_____

high school_____ No. of years_____ Graduated_____

college_____ No. of years_____ Graduated_____

9. Education of mother:

grade school_____ No. of years_____

high school_____ No. of years_____ Graduated_____

college_____ No. of years_____ Graduated_____

10. Income level (total family income):

_____ $ 4,999 and under
_____ 5,000 - 7,999
_____ 8,000 - 9,999
_____ 10,000 - 11,999
_____ 12,000 and above
_____ undeclared

11. Do you subscribe to a newspaper? yes_____ no_____

If yes, please list those which you subscribe to or buy regularly.

	daily	weekly	other
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

How do you dispose of these?

12. What magazines do you subscribe to or buy regularly?

	weekly	monthly	other
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(Please list additional ones on the back of this paper.)

How do you dispose of these?

13. Do you plant and harvest from a home garden? yes_____ no____

14. Do you do home canning or freezing? yes_____ no_____

	yes	no	Of all you use, % canned or frozen.
a. fruit	___	___	_____
b. vegetables	___	___	_____
c. meats	___	___	_____
d. juices	___	___	_____
e. pickles, olives, etc.	___	___	_____
f. jams, jellies, etc.	___	___	_____
g. other (please list)	___	___	_____
	___	___	_____
	___	___	_____

15. Do you fish? yes_____ no_____

If yes, please estimate the percent of your total meat diet this comprises.

_____

Do you: process it at home _____
have it processed commercially _____
eat fresh only _____

16. Do you hunt for game birds? yes_____ no_____

If yes, please estimate the percent of your total meat diet this comprises.

_____

Do you: process it at home _____
have it processed commercially _____
eat fresh only _____

17. Do you hunt large game? yes_____ no_____

If yes, please estimate the percent of your total meat diet this comprises.

_____

17. cont.

Do you: process it at home _____
have it processed commercially_____
eat frest only _____

18. How often do you shop for groceries?

_____more than once a week
_____once a week
_____every two weeks
_____every three weeks
_____monthly
_____other (specify)

19. Is your milk:

_____delivered in cartons
_____delivered in bottles
_____purchased in cartons
_____purchased in bottles
_____other (specify)

20. Do you have a kitchen disposal? yes_____ no_____

21. Do you have a trash masher? yes_____ no_____

22. Please list types of recreation or leisure activities which you and your family participate in.

_____

_____

_____

_____

23. Our family uses the following paper products:

	always	often	seldom	never
tissues (kleenex etc.)	____	____	____	____
paper towels	____	____	____	____
paper plates	____	____	____	____
paper cups	____	____	____	____
paper table cloths	____	____	____	____
disposable diapers no.____	____	____	____	____
dish cloths	____	____	____	____
place mats	____	____	____	____
napkins	____	____	____	____
scratch paper &/or type paper	____	____	____	____
other (please list)				
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____

Name_____

POST QUESTIONNAIRE

PLEASE COMPLETE THIS POST QUESTIONNAIRE. YOUR ANSWERS CAN BE AS SHORT AS YOU WISH. FEEL FREE TO MAKE ANY COMMENTS OR OBSERVATIONS.

1. Are you more aware now of the paper products which you discard or use than you were before participating in this study?

2. Do you feel there is a waste paper problem in Logan City?

3. Were you surprised at the amount of waste paper which you accumulated during a one-week period?

4. Could you identify one specific way you could cut your waste paper? If so, how? (please be specific) Would you consider doing it?

5. Did your children show an interest in this project? If so, what did they do or say?

6. Would you like to know how your total waste paper weight was compared to the other participants?

   YES_____ NO_____ I DON'T CARE_____

Here is a table listing the weight of the paper I collected from each family during the first week, second week, and the total weight for the two weeks. If you have any questions concerning the study, please feel free to call me. I would be glad to talk with you about it. Thanks again for your help and time.

TOTAL POUNDS OF WASTE PAPER OUTPUT

Family No.	Week 1 lb.	oz.	Week 2 lb.	oz.	Total lb.	oz.
1.	3	15	4	00	7	15
2.	2	12	5	04	8	00
3.	3	13	4	09	8	06
4.	4	12	4	15	9	11
5.	4	08	5	04	9	12
6.	4	06	5	13	10	03
7.	4	12	5	09	10	05
8.	5	03	5	14	11	01
9.	6	01	5	07	11	08
10.	4	09	7	04	11	13
11	3	13	8	02	11	15
12.	5	14	6	01	11	15
13.	5	08	6	08	12	00
14.	7	13	4	12	12	09
15.	9	03	4	06	13	09
16.	6	04	7	06	13	10
17.	7	02	7	01	14	03
18.	7	00	7	04	14	04
19.	7	08	7	04	14	12
20.	6	08	8	06	14	14
21.	7	14	7	03	15	01
22.	10	00	6	10	16	10
23.	7	09	9	02	16	11
24.	6	11	10	02	16	13
25.	7	09	9	06	16	15
26.	8	11	8	09	17	04
27.	8	06	9	03	17	09
28.	12	00	5	15	17	15
29.	10	04	9	08	19	12
30.	10	00	9	12	19	12
31.	9	04	12	12	22	00
32.	11	00	12	01	23	01
33.	12	12	10	05	23	01
34.	10	06	13	01	23	07
35.	16	11	9	06	26	01
36.	12	09	16	03	28	12
37.	14	05	17	08	31	13
38.	14	04	17	15	32	03
39.	15	00	17	04	32	04
40.	20	11	17	04	37	15
41.	18	05	20	05	38	10
42.	21	03	41	02	62	05
AVERAGE	8	15	9	07	18	12

VITA

Dena Lee Child Call

Candidate for the Degree of

Master of Science

Thesis: Family Conditions and Practices Related to Waste Paper Output

Major Field: Home Economics and Consumer Education

Biographical Information:

Personal Data: Born at Afton, Wyoming March 9, 1951, of E. Ralph and Marie Stoor Child; married Bruce L. Call, September 18, 1970; one son -- Jason Edward.

Education: Attended elementary school at Grover, Wyoming, attended Star Valley High School in Afton, Wyoming; graduated in 1969; completed requirements for Bachelor of Science degree in 1972, with a major in Family Relations, and minors in Office Administration, and Household Economics and Management; completed requirements for Master of Science degree in Home Economics and Consumer Education at Utah State University in 1973.

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